

REMARKS

It is respectfully requested that the claims be amended as shown in the attached sheets; specifically, claims 1-6, 11 and 19-21 have been canceled, claim 7 has been rewritten as new claim 22 and claim 8 has been revised to depend from claim 22.

The examiner has rejected claims 2 and 3 under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. This rejection is moot in view of the cancellation of claims 1-6, as well as claims 11 and 19-21.

The examiner has rejected claims 7-10 as being unpatentable under 35 USC §103 (a) over the admitted prior art in view of Koch et al, US Patent 6,309,404, hereinafter Koch et al, further in view of Roth, US Patent 5,938,854, hereinafter Roth. Applicants' response to this rejection is contained in the previous amendment. With respect to the admitted prior art, this section merely points out the problems with prior art solutions, or their shortcomings. It in no way suggests the solution of the present invention. It is pointed out that the application reiterates that silicones are particularly difficult to bond to other devices. This is especially true when the silicones have silicone oils or other products that contain silicone residues on the surface. This is the case with the present invention wherein silicone mold releases are incorporated in the molding product, and are present on the surface of the resultant molded article. Koch et al relate to tire art and have nothing to do with bonding heat sinks to encapsulated chips. Since tires are not made from silicone with a silicone oil mold release, Koch et al could not teach or suggest the solution when there is silicone oil or other residual silicone products on the surface of the silicone article. Moreover, Koch et al teach removing a cure skin on the surface of the tire by roughening and the use of a rubber primer over the roughened surface, and preferably use a solvent to clean or

remove any residue from the surface. As pointed out in the application at page 2, line 24, through page 3, line 6:

One attempt at resolving the problem of mechanical attachment involves using adhesive to create a uniform bond between the package's cover (overmold) member and a heat sink. Unfortunately, many electronic packages are made of substances or are assembled with substances to which it is very difficult to adhere a heat sink. Typical adhesives that are expected to bond to polymer compounds will not effectively bond a heat sink to polymer compounds typically used as package overmold materials. This problem has been encountered in the production of plastic ball grid array (PBGA) packages, in particular, PBGA packages with an overmold cover over the package's chip(s). Examples of such packages are defined in 6,206,997, 5,729,440, 5,726,079 and 5,655,703. All of these patents, assigned to the assignee of this invention, are incorporated herein by reference.

Silicone residue cannot be easily removed and solvents will not accomplish this; thus, there is no teaching of the reduction of the effect of silicone oils and silicone residual products by the use of abrasive products, even in the non-relevant tire art. As stated in the parent case, and reiterated in the present application at page 7, line 13, through page 8, line 4, the purpose of the plasma in the instant application is not to clean the surface, but rather to convert the surface silicone oils and silicone residues to a smooth adherent surface. Roth describes using plasma processing to remove the final few monolayers of machining oils and plasticizers. So, plasma is used as a cleaning process to remove adverse contaminants, not to convert the surface oils and silicone residues on the surface to a more adherent surface. In the present application, plasma is used to chemically convert an undesirable contaminant to a more desirable surface. As indicated above, the silicone mold release is imparted to the bulk transfer molding pellet and, during molding, some of the release agent migrates to the mold surfaces to facilitate release. As stated in Roth, chemical cleaning of the surfaces is never effective to completely remove all contaminants. Siloxanes, which encompass the form most assumed by the silicone oils, are particularly resistant to cleaning and always linger at a level that is troublesome for adhesive bonding. If the surface


is cleaned, more silicone will simply migrate from the bulk to the surface. Anything it removes can be replenished from the bulk. Plasma converts the silicone to silica, which is a much easier surface for bonding. Further, silica or the glass coating seals off the silicone from the bulk. So, the plasma process is a robust solution to siloxane laden molding compounds. Hence, it is not obvious that simple abrasion followed by a plasma treatment would provide the necessary improvement to adhesion. Claims 8-10 are dependent, directly or indirectly, on claim 22. The examiner, in reply to these arguments, takes the position that the claims do not mention the purpose of the plasma treatment. However, it is pointed out that this is a functional statement which does not change what the plasma does, and the cited prior art does not show the exposure of silicone oils or silicone containing residues to a plasma. Thus, there is no teaching of this. Claim 22 (claim 7 in independent form), as well as claims 8-10, are clearly allowable over any reasonable combination of the admitted prior art, Koch et al and Roth.

Claims 7-10 have been rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-5 of US Patent 6,206,997 in view of Koch et al. Since a terminal disclaimer is being filed with this amendment, it is believed that this rejection is completely met.

In view of the above, it is believed that each of the claims NOW in the application is distinguishable one from the other and over the prior art. Therefore, reconsideration and allowance of the claims is respectfully requested.

Respectfully submitted,

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WNH:cg
Enclosure